Habitat Conservation Plan

for the Properties of

The Pacific Lumber Company,
Scotia Pacific Holding Company,
and Salmon Creek Corporation

February 1999

ERRATA TO THE HCP

Insert this paragraph as the new first paragraph on page P-69, Subsection 6.3.6, Adaptive Management:

> The purpose of adaptive management is to provide a mechanism to ensure that HCP prescriptions are implemented in a manner that reflects sound science, taking into account new data and analysis. Adaptive management also provides flexibility by allowing alternative approaches for achieving biological goals under certain circumstances, in order that the HCP can be implemented in a manner that is sensitive to both economic concerns and biological necessities.

Insert this sentence at the end of the first full paragraph on page P-70:

> The Wildlife Agencies shall disapprove PALCO's proposed changes if they are in conflict with AB 1986 or if the Wildlife Agencies find, in writing, that PALCO's proposed changes will impair the ability of the plan to achieve, over time, or maintain properly functioning aquatic habitat conditions.

Delete "and the Grizzley Creek complex" in the second line of the first bullet on P-18, Subsection 6.1.2.1, Establishment of Marbled Murrelet Conservation Areas and Other Protective Buffers.

Delete the last sentence of the first bullet on P-18, Subsection 6.1.2.1, Establishment of Marbled Murrelet Conservation Areas and Other Protective Buffers which reads:

> The Grizzley Creek complex acreage is 1,409 acres.

Delete the first sentence of the third bullet on P-18, Subsection 6.1.2.1, Establishment of Marbled Murrelet Conservation Areas and Other Protective Buffers, and insert the following sentence in its place:

> The Grizzley Creek complex, will include an additional 351 acres for a total of 1,409 acres, as shown in Figure 4, and will be protected for the first five years of the permit.

On P-34, in the first bullet, first sentence, second line, after "that nesting" add "has not occurred or."

On P-34, in the fifth bullet, first line, delete "On thousand thirty-six" and insert the following language in its place:

> One thousand three hundred thirty-six

On P- 44, in paragraph 15, first line, after "A Federal" insert the following language:

> and/or state permit

February 1999

Dear Reader:

This copy of the "Habitat Conservation Plan for the Properties of The Pacific Lumber Company, Scotia Pacific Holding Company, and Salmon Creek Corporation," dated February 1999, incorporates editorial changes to the Habitat Conservation Plan attached as Appendix P of the "Final Environmental Impact Statement/Environmental Impact Report and Habitat Conservation Plan/Sustained Yield Plan for the Headwaters Forest Project," dated January 1999. These editorial changes did not change the meaning of the January Habitat Conservation Plan. Rather, the changes were made to clarify language.

Habitat Conservation Plan

for the Properties of

The Pacific Lumber Company,
Scotia Pacific Holding Company,
and Salmon Creek Corporation

February 1999

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Attachment 4 Changed and Unforeseen Circumstances
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AB 1986	California State Assembly Bill 1986
ACD	Angular canopy density
ANOVA	Analysis of variance
BFN	board feet net
°C	Degrees Celsius
CCC	California Conservation Corps
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CHERT	County of Humboldt Extraction Review Team
CWHR	California Wildlife Habitat Relationships
cm	centimeter(s)
CMZ	channel migration zone
CNPS	California Native Plant Society
CPOM	coarse particulate organic matter
dbh	diameter at breast height
DEIS/DEIR	Draft environmental impact statement/draft environmental impact report
DI	disturbance index
DOM	dissolved organic matter
EEZ	equipment exclusion zone
ELZ	equipment limitation zone
EPA	(U.S.) Environmental Protection Agency
ERA	equivalent roaded area
ESA	Endangered Species Act (Federal)
ESU	ecologically significant unit
FEIS	Final environmental impact statement
FEMAT	Forest Ecosystem Management Assessment Team
FPOM	fine particulate organic matter
FPRs	(California) Forest Practice Rules
GIS	Geographic information system
GPS	Global positioning system
HCP	habitat conservation plan
ITP	incidental take permit
LEB	limited entry band
LMZ	limited management zone
LOP	(USACE) Letter of Permission
LTO	licensed timber operator
LTSY	long-term sustained yield
LWD	large woody debris
m	meter(s)
mbfn	thousand board feet net
mm	millimeter(s)

ACRONYMS AND ABBREVIATIONS (CONTINUED)

MMCA	marbled murrelet conservation area (also "MCA" in some reports)
MMRT	marbled murrelet recovery team
MWAT	maximum weekly average temperature
NCASI	National Council for Air and Stream Improvement
NCRWQCB	[California] North Coast Regional Water Quality Control Board
NDDB	National Diversity Data Base
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NSO	northern spotted owl
NSOSRP	Northern Spotted Owl Scientific Review Panel
OCP	Operating Conservation Plan
POM	particulate organic matter
PSG	Pacific Seabird Group
PWA	Pacific Watershed Associates
RHB	restricted harvest band
RMZ	riparian management zone
RPF	registered professional forester
RWQCB	Regional Water Quality Control Board
SEB	selective entry zone
SYP	sustained yield plan
THP	timber harvest plan
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAA	watershed assessment area
WDNR	Washington Department of Natural Resources
WLPZ	watercourse and lake protection zone

Activity site— An activity site (or activity center) is the area including the primary roost tree of a non-nesting pair or single NSO, or the nest tree of a nesting pair. The most current NSO location shall be used to assess status.

Aggradation— Deposition in one place of material eroded from another. Aggradation raises the elevation of streambeds, floodplains, and the bottoms of other water bodies.

Anadromous fish— Fish that hatch and rear in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Salmon and steelhead are examples of anadromous fish.

Bankfull width— Channel width between the tops of the most pronounced banks on either side of a stream reach.

Boulders— Substrate particles greater than 256 mm in diameter. Often subclassified as small (256 to 1,024 mm) and large (greater than 1,024 mm) boulders.

Cable yarding— The system of transporting logs (typically used with ground-based equipment, e.g., tractor, rubber tire skidder, etc.) by means of cable (wire rope) to the yarding machine (yarder) or a landing while the yarder remains stationary.

Canopy closure— The proportion of an area covered by tree crowns.

Canopy cover— Vegetation projecting over waters, including crown cover (generally more than 1 m above the water surface) and overhead cover (less than 1 m above the water).

Channel— Natural or artificial waterway of perceptible extent that periodically or continuously contains moving water.

Channel migration zone (CMZ)— The boundary generally corresponds to the modern floodplain, but may also include river terraces that are subject to significant bank erosion. The area adjacent to watercourses constructed by the river in the present climate and inundated during periods of high flow. The floodplain is delineated by either the flood-prone area (twice bankfull depth) or the 100-year floodplain, whichever is greater.

Class I Waters— Fish are always or seasonally present onsite. Class I waters include habitat to sustain fish migration, spawning, and rearing. They also include domestic water supplies, such as springs, onsite or within 100 feet downstream from the project operations area.

Class II Waters— Non-fish bearing waters. Aquatic habitat is present for non-fish aquatic species, including in watercourses, streams, seeps, springs, lakes, ponds, and wetlands.

Class III Waters— No aquatic life or habitat present. Class III waters show evidence of being capable of sediment transport to Class I and Class II waters under normal high water flow conditions before or after completion of timber operations.

Closed road— A proactive method of closing a road so that regular maintenance is no longer needed, and future erosion is largely prevented. The goal of road closure is to leave the road so that little or no maintenance is required for stability while the road is unused. Closed roads usually involve erosion-proofing techniques, including removing stream crossing fills and culverts, removing unstable road and landing fills, installing cross-road drains (e.g., rolling dips

and water bars) for permanent road surface drainage, and other erosion prevention and erosion control measures as needed. Proper road closure is not accomplished by blocking a road and walking away from it to let "nature reclaim the road."

Cobble— Substrate particles 64 to 256 mm in diameter; often subclassified as small (64 to 128 mm) and large (128 to 256 mm) cobble.

Commercial thinning— The removal of trees in a young-growth stand to maintain or increase average stand diameter of the residual trees, promote timber growth, and improve forest health. The residual stand consists primarily of healthy vigorous dominant and codominant trees from the preharvest stand.

Conservation— The use of all methods and procedures which are necessary to bring any endangered or threatened species to the point at which the measures provided pursuant to the State and Federal Endangered Species Acts are no longer necessary.

Covered lands— The lands upon which the federal and state permits authorize incidental take of covered species and the lands to which the operating conservation program applies, including, upon their acquisition, the additional lands.

Critical habitat— Defined in the federal Endangered Species Act (1973) to include the area occupied by a species at the time it is listed, specific areas in the vicinity of the occupied habitat, and specific areas away from the occupied habitat considered essential for the conservation of the species.

Culvert— Buried pipe structure that allows streamflow or road drainage to pass under a road.

Cumulative impact— The incremental environmental impact of an action together with impacts of past, present, and reasonably foreseeable actions (regardless of the source of the other actions).

Decommissioned road— A method of removing those elements of a road that unnaturally reroute hillslope drainage or present slope stability hazards; to return a road prism back to its natural hillslope contours.

Degradation— Erosional removal of materials from one place to another within a watercourse. Degradation lowers the elevation of streambeds and floodplains.

Drainage area (watershed)— Total land area draining to any point in a stream, as measured on a map, aerial photo, or other horizontal, two-dimensional projection.

Equipment exclusion zone (EEZ)— The area where heavy equipment associated with timber operations is totally excluded for the protection of aquatic habitat, aquatic species, water quality, and beneficial uses of water and other forest resources.

Embeddedness— Degree to which large particles (boulders, rubble, gravel) are surrounded or covered by fine sediment; usually measured in classes according to percent coverage.

Emergency timber operations— Defined in the 1998 California Forest Practice Rules, Subchapter 7, Article 2, Section 1052, Subsections 1052.1, 1052.2, and 1052.3.

GLOSSARY (CONTINUED)

Endangered species— Any plant or animal species in danger of extinction in all or a significant part of its range.

Endangered Species Act (ESA)— Federal Act of 1973, as amended, 16 USC Sections 1531 - 1543; California Act of 1984, as amended, Fish and Game Codes Sections 2050-2098.

Exemption harvest— Defined in the 1998 California Forest Practice Rules, Subchapter 7, Article 2, Section 1038.

Extinct— Species lacking a living representative; species which no longer exists in its original form.

Fine sediments— Sediment with particle sizes of 2 mm and less, including sand, silt, and clay.

Fry— Life stage of trout and salmon between full absorption of the yolk sac and a somewhat arbitrarily defined fingerling or parr stage (generally reached by the end of the first summer).

Gradient— Average change in vertical elevation per unit of horizontal distance.

Gravel— Substrate particles between 2 and 64 mm in diameter.

Habitat conservation plan (HCP)— A plan which describes expected impacts and the conservation measures designed to minimize and mitigate those impacts on fish and wildlife species; required as part of a Section 10(a)(1)(B) incidental take permit application under the federal ESA and may be used as part of the Section 2081(b) application under CESA.

Harass— A form of take under the federal ESA; defined in federal regulations as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3).

Harm— A form of take under the federal ESA; defined in federal regulations as an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation where it actually kills wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3).

Headwall swale— A concave depression, with convergent slopes typically of 65 percent or greater that is connected to waters via a continuous linear depression. A linear depression interrupted by a landslide deposit is considered continuous for this definition.

Hydrologic unit— Contains all areas that drain into a single basin. Larger than an individual planning watershed, but smaller than a watershed analysis area. Not to be confused with the state of California Regional Water Quality Control Board (RWQCB) HUs.

Improperly abandoned road— A road that is no longer in use and was walked away from to let "nature reclaim it." The road has not been erosion-proofed and is not maintained, but access may be blocked by a gate, berm, or road failure.

Incidental take— The taking of a federally or state listed species, if such taking is incidental to, and not the purpose of, carrying out otherwise lawful activities.

GLOSSARY (CONTINUED)

Inner gorge— That area of a watercourse bank situated immediately adjacent to the watercourse channel, having side slope of 65 percent of greater and extending from the edge of the channel upslope to the first break-in-slope (a break-in-slope is defined as a slope less than 65 percent for a distance of 100 feet or more) above the watercourse channel.

Large woody debris (LWD)— Any large piece of woody material that is deposited to the forest floor, the water, the streambeds, or the channel. Its smallest diameter is generally greater than 10 cm and its length is greater than 1 m.

Mass wasting— The downslope movements of earth caused by gravity (i.e., without major action of water, wind, or ice). It includes, but is not limited to, landslides, log dam breaks, rock falls, debris torrents, and creep. It does not , however, include surface erosion by running water. It may be caused by natural erosion processes, natural disturbances (e.g., earthquakes or fire events), or human disturbances (e.g., mining or road construction).

Mass-wasting areas of concern— A combination of all areas defined as inner gorges, headwall swales, unstable areas, and areas of high, very high, and extreme mass wasting hazard potential.

Merchantable— A tree that is 8 inches in diameter breast height (dbh).

Mitigation— Measures undertaken to diminish or compensate for the negative impacts of a project or activity on the environment, including (a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or (e) compensating for the impact by replacing or providing substitute resources or environments.

Monitoring— The process of collecting information to assess and document implementation and effectiveness of mitigation measures and to evaluate whether or not the objectives of the habitat conservation plan are being realized.

Nesting pair— Nesting pair status will be assigned if on two visits spaced at least one week apart before May 1, or one visit after May 1 a male and female are seen/heard within 0.25 mile of each other on the same visit and any of the following occurs: (a) a female is observed on a nest, (b) either a male or female is observed delivering prey to a nest, (c) a female is observed with a brood patch (mid-April to mid-June), or (d) young are detected with an adult.

No-harvest band— The first band of the Class I (0 to 100 feet), Class II, (0 to 30 feet), and Class III (0 to 30 feet) RMZs prior to watershed analysis. No timber harvest is allowed in this band, including sanitation salvage, exemption harvest, and emergency timber operations.

Outer band— The second band (100 to 170 feet) of the RMZ on Class I waters. Under certain circumstances, selected harvest can occur in this band.

Pair— Pair status will be assigned if on two visits spaced at least one week apart before May 1, or one visit after May 1, a male and female are seen/heard within 0.25 mile of each other or (a) a male is observed taking a mouse to a female, (b) a female is observed on a nest, or (c) young are detected with an adult.

GLOSSARY (CONTINUED)

Parr— Young salmonid, in the stage between alevin and smolt, that has developed distinctive dark "parr marks" on its sides and is actively feeding in fresh water.

Pistol-butted— A tree whose base exhibits a downslope curve followed by a return to a normal vertical trunk. This is considered an adjustment to slow downslope movement of the underlying soil.

Planning watershed— The contiguous land base and associated watershed system that forms a fourth order or other watershed, typically 10,000 acres or less in size. CDF has prepared and distributed maps identifying the planning watersheds.

Pool— Portion of a stream with reduced current velocity, often with deeper water than surrounding areas and with a smooth surface.

Population— A collection of individuals who share a common gene pool.

Reconstructed road— Those existing roads that are to be restored or improved to be useable for hauling forest products. A reconstructed road does not include routine or annual maintenance or rehabilitation that would require substantial change in the original prism of the road.

Redd— A nest made in gravel, consisting of a depression a fish digs to deposit eggs and its associated gravel mounds.

Registered professional forester (RPF)— A person who holds a valid license as a professional forester pursuant to Article 3, Section 2, Division 1 of the California Public Resources Code.

Reproductive rate (i.e., nesting success)— Reproductive rate is calculated annually by dividing the total number of fledglings observed by the total number of NSO pairs monitored to determine reproductive output.

Residual timber stands— Stands of timber that have been selectively harvested, leaving behind some of the original old-growth trees.

Riparian management zone (RMZ)— The area on either side of Class I, Class II, or Class III waters that receives special treatment. May refer to any combination of the following: no harvest band, selective entry band, outer band and/or sediment filtration band.

Riparian vegetation— Vegetation growing on or near the banks of a stream or other body of water in soils that exhibit some wetness characteristics during some portion of the growing season.

Run (fish)— A group of fish migrating in a river (most often on a spawning migration) that may comprise one or many stocks.

Salmonids— Fish of the family Salmonidae, including salmon, trout, chars, whitefish, ciscoes, and grayling.

Sand— Substrate particles 0.061 to 2 mm in diameter.

Sanitation salvage— Sanitation is the removal of insect-attacked or diseased trees in order to maintain or improve the health of the stand. Salvage is the removal of only those trees that are dead, dying, or deteriorating because of damage from fire, wind, insects, disease, flood or other

injurious agent. Sanitation and salvage may be combined into a single operation and for the purposes of this plan are considered the same operation.

Section 2080— The section of the California Endangered Species Act that prohibits the "taking" of endangered and threatened species listed by the California Fish and Game Commission and species that the Commission has elevated to the status of candidates for such listing.

Section 2081(b), Section 2081(b) Permit— The section of the California Endangered Species Act through which the California Department of Fish and Game may authorize, by permit, the take of endangered species, threatened species, and candidate species.

Section 7— The section of the federal Endangered Species Act, codified at 16 USC § 1536, that provides for consultation between federal agencies and the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species.

Section 9— The section of the federal Endangered Species Act, codified at 16 USC § 1538, that prohibits the "taking" of any listed species.

Section 10(a)— The section of the federal Endangered Species Act, codified at 16 USC § 1539(a), that allows taking of a listed species for scientific purposes and taking incidental to otherwise lawful activities subject to approval of the Department of Interior or the Department of Commerce as appropriate; both types of take require permits.

Sediment— Fragments of rock, soil, and organic material transported and deposited in beds by wind, water, or other natural phenomena.

Sediment filtration band— The second band (30 to 50 feet, or 100 feet) in the Class III RMZs. Timber harvest is allowed in this band.

Sedimentation— Deposition of material suspended in water or air, usually when the velocity of the transporting medium drops below the level at which the material can be supported.

Selective entry band— The second band (30 to 130 feet) in Class II RMZs. Under certain circumstances, selected timber harvest can occur 30 to 50 feet or 100 feet, in this band.

Sensitive species— Here, a category of species designated for special protection by the California Board of Forestry.

Silt— Substrate particles 0.004 to 0.062 mm in diameter.

Slash— Branches or limbs less than four inches in diameter, and bark and split products debris left on the ground as a result of timber operations (Z'berg-Nejedly Forest Practice Act of 1973).

Snag— A standing dead tree.

Species— Any distinct population of wildlife that interbreeds when mature.

Stream— A natural watercourse as designated by a solid line or dash and three dots symbol shown on the largest scale United States Geological Survey map most recently published (Z'berg-Nejedly Forest Practice Act of 1973).

GLOSSARY (CONTINUED)

Stream order— A number from one to six or higher, ranked from headwaters to river terminus, that designates the relative position of a stream or stream segment in a drainage basin. First-order streams have no discrete tributaries; the junction of two first-order streams produces a second-order stream; the junction of two second-order streams produces a third-order stream; etc.

Substrate— Mineral or organic material that forms the bed of a stream.

Suitable NSO habitat— Suitable NSO habitat is an area characterized by foraging, roosting, and nesting.

Suspended Sediment— That part of a water's total sediment load carried in the water column.

Take— As defined in the federal Endangered Species Act, to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a threatened or endangered species, or attempt to do so. See also "harm" and "harass." As defined in CESA, take means to hunt, pursue, catch, capture, or kill, or to attempt to hunt, pursue, catch, capture, or kill.

Thalweg— The deepest point of a watercourse along any channel cross section.

Threatened species— Any species or subspecies that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Timber harvesting plan (THP)— A three-year plan for the harvesting of commercial timberlands that (1) must be prepared by a registered professional forester, (2) must be filed with and approved by the California Department of Forestry, and (3) must contain detailed information about the land to be harvested, the silviculture methods to be applied, special provisions (if any) to protect unique and sensitive resources in the area, the dates when timber operations will begin and end, and any other information that may be required by the California State Board of Forestry.

Timberland— Land, other than land owned by the federal government and land designated by the California Board of Forestry as experimental forestland, which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species are determined by the state board on a district basis (Z'berg-Nejedly Forest Practice Act of 1973).

Timber operations— The cutting or removal of timber or other solid wood forest products, including Christmas trees, from timberlands for commercial purposes, together with all the work incidental thereto, including, but not limited to, construction and maintenance of roads, fuelbreaks, firebreaks, stream crossings, landings, skid trails, beds for the falling of trees, and fire hazard abatement, but excluding preparatory work such as tree marking, surveying, or road flagging (Z'berg-Nejedly Forest Practice Act of 1973).

Unstable area— Characterized by slide areas or by some or all of the following— hummocky topography consisting of rolling bumpy ground, frequent benches, and depressions; short irregular surface drainages that begin and end on the slope; tension cracks and headwall scarps; slopes that are irregular and may be slightly concave in the upper half and convex in the lower half from previous slope failure; evidence of impaired groundwater movement resulting in local zones of saturation within the soil mass that are indicated at the surface by sag ponds with

standing water, springs, or patches of wet ground. Some or all of the following may be present— hydrophytic vegetation is prevalent; leaning, jackstrawed, or split trees are common; pistol-butted trees with excessive sweep may occur in areas of hummocky topography (leaning trees should be used as indicators of unstable areas only in the presence of other indicators).

Watercourse— Any well-defined channel with distinguishable bed and bank showing evidence of having contained flowing water indicated by deposit of rock, sand, gravel, or soil, including but not limited to streams.

Waters— Includes streams, watercourses, seeps, springs, lakes, ponds, and wetlands.

Watercourse or Lake Transition Line— That line closest to the watercourse or lake where riparian vegetation is permanently established. Willows are not considered permanent vegetation.

Watershed— see "Drainage Area."

wildlife agencies— United States Fish and Wildlife Service (USFWS); National Marine Fisheries Service (NMFS); and California Department of Fish and Game (CDFG).

Wildlife Habitat Relationships (WHR) System— A vegetation classification system that is correlated to a computer model developed to evaluate the characteristics of forest and other habitat types in California with the habitat requirements of birds, mammals, reptiles, and amphibians species.

Yarding: Movement of timber from the point of felling to a yarder, road, or landing.

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Yarding: Movement of timber from the point of felling to a yarder, road, or landing.

1 ORGANIZATION

This Habitat Conservation Plan (HCP or Plan) is the HCP prepared in response to the requirements of the federal Endangered Species Act (FESA) and California Fish and Game Code (FGC). This document includes the HCP elements required by the FESA. The HCP elements covered in this document include impacts to the covered species and the operating conservation program, including minimization, mitigation, and monitoring measures, alternatives considered, funding, and other measures. See Figure 1 for a map of the entire Planning Area.

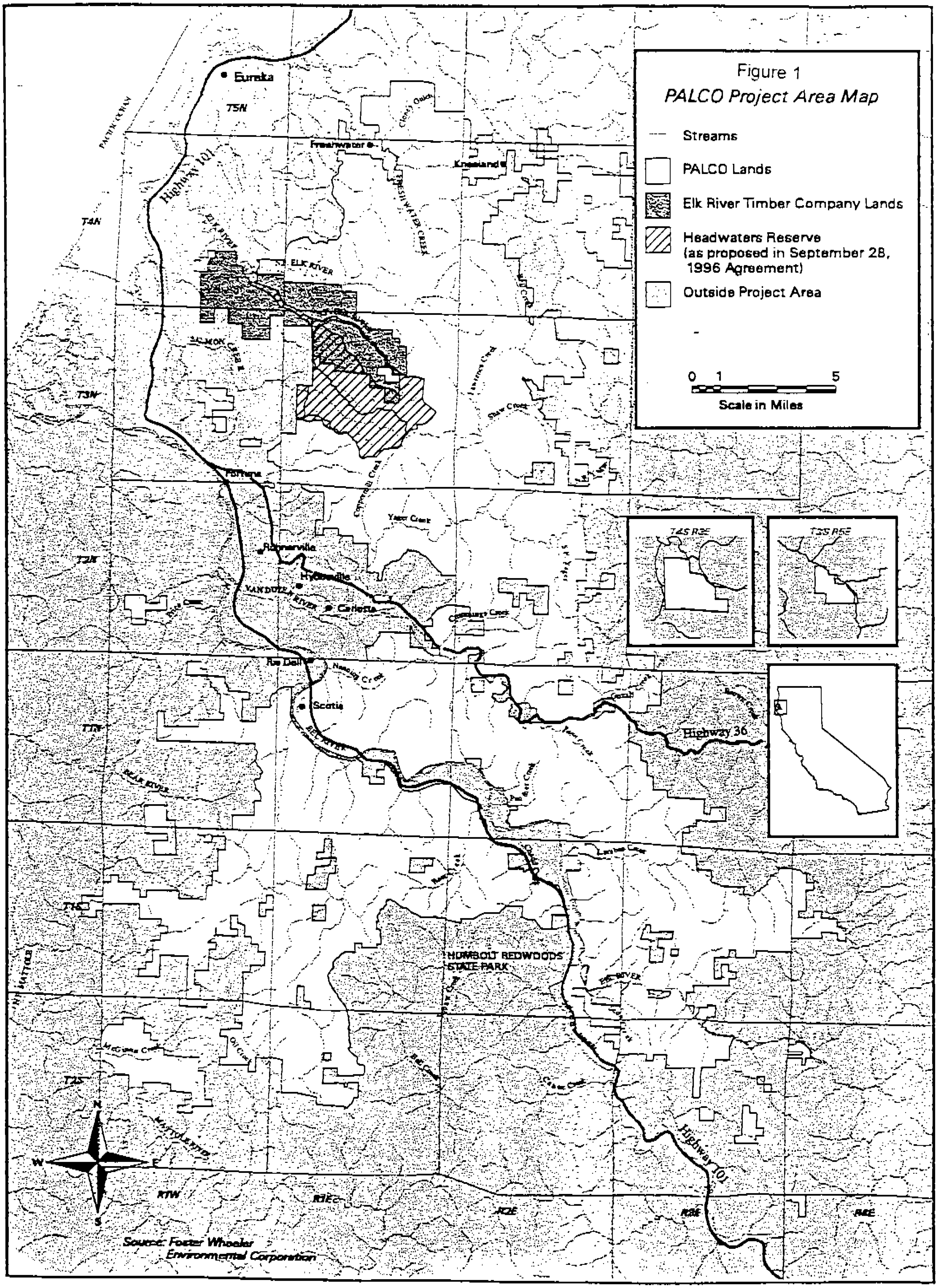

Figure 1
PALCO Project Area Map

–September 21, 1998

2 PLANNING CONTEXT

Preparation of this Plan has been guided by the following:

- Species protection requirements, incidental take provisions, and other sections of the FESA and the California FGC (including, but not limited to, the California Endangered Species Act (CESA)
- The agreement reached in September 1996 regarding the transfer of approximately 7,500 acres of Pacific Lumber Company (PALCO) and Elk River Timber Company (ERTC) properties to the United States of America and the state of California (Headwaters Agreement)
- The Pre-permit Application Agreement in Principle reached in February 1998 regarding components and completion of this Plan and interim measures to be implemented by PALCO (Agreement in Principle)
- The Draft SYP/HCP and public comments

2.1 HCP CONSIDERATIONS

Consistent with the objectives of the FESA and the California Fish and Game Code (FGC), the Plan is a long-term comprehensive program to ensure the continued health of the biological communities on PALCO's property and to minimize and mitigate impacts of PALCO activities on individual species. In this regard, the Plan has both a multi-species and a habitat focus; it also has a specific legal purpose with regard to impacts to species and habitats.

Similar to other habitat-based multi-species HCPs (e.g., Plum Creek and plans approved in southern California under the Natural Community Conservation Planning [NCCP] Act), this Plan was developed by focusing on the requirements of selected species (focus species) while also addressing the needs of other species in the same habitat. This tiered approach is an essential feature of the Plan's terrestrial and aquatic conservation strategies. Marbled murrelet (*Brachyramphus marmoratus*) and northern spotted owl (*Strix occidentalis caurina*) are the focus species for the terrestrial strategy, and the measures for these two birds are designed to benefit a broad range of other species in PALCO's managed forests. Some measures, such as the establishment of marbled murrelet conservation areas (MMCAs), preserve and protect Focus and other species in specific locations. Other measures, such as maintaining a mix of seral types across the landscape and retaining structural components of wildlife habitat, benefit Focus and other species by sustaining important features of the larger ecosystem. The Plan's aquatic habitat conservation strategy functions in a similar way. In this case, the focus species are four fish (coho salmon in the southern Oregon/northern California coastal evolutionary significant unit [ESU], *Oncorhynchus kisutch*; chinook salmon in the southern Oregon/California coastal ESU, *Oncorhynchus tshawytscha*; cutthroat trout in the southern Oregon/California coast ESU, *Oncorhynchus clarki*, and steelhead trout in the northern California ESU, *Oncorhynchus mykiss*). Measures for these species focus on habitat conditions in fish-bearing streams and extend outward to encompass riparian zones and entire watersheds.

As described in Part A of Volume V, of the July 1998 Draft SYP/HCP a primary purpose of the Plan is to provide the basis for the U.S. Fish and Wildlife Service (USFWS), the National

Marine Fisheries Service (NMFS), and the California Department of Fish and Game (CDFG) to authorize incidental take of certain listed species, including some species that currently are not, but may be, listed during the life of the Plan. Specifically, PALCO is seeking authorization for incidental take from USFWS and NMFS pursuant to Section 10(a) of the FESA and from CDFG pursuant to Section 2081(b) of the FGC. For purposes of the incidental take permits (ITPs), the Plan does the following:

1. Identifies the species that would be covered by the permits (covered species)
2. Treats unlisted covered species as if they were listed
3. Identifies alternatives to the taking, and presents the reasons why the alternatives were not employed
4. Examines the impacts of the proposed take on the species
5. Identifies measures to minimize and mitigate impacts
6. Includes provisions for responding to changed and unforeseen circumstances
7. Provides assurances that adequate funding is available for implementation
8. Provides assurances that the Plan will be implemented

In connection with ongoing timber operations and implementation of the Plan, PALCO also is seeking a five-year renewable Streambed Alteration Agreement with CDFG pursuant to Section 1603 of the FGC. For purposes of the 1603 agreement, the Plan identifies PALCO plan area activities with the potential to alter streams and riparian areas under CDFG's jurisdiction and substantially adversely affect fish and wildlife resources. The 1603 Agreement identifies measures for certain of these PALCO plan area activities that are covered under the 1603 Agreement that PALCO will implement to avoid, minimize, and mitigate such impacts. This Plan is the HCP submitted with PALCO's ITP applications to USFWS and NMFS and provides the information and analysis CDFG requires for its consideration of incidental take authorization.

2.2 HEADWATERS AGREEMENT

The September 1996 Headwaters Agreement (FEIS, Appendix A) contemplates government acquisition of timberlands from PALCO and another landowner to preserve approximately 7,500 acres of old-growth and young-growth timber stands and associated buffers in a nature reserve. As proposed, PALCO would transfer ownership of two unentered old-growth timber stands and associated buffers (i.e., PALCO's Headwaters and Elk Head Springs timber stands) to the state and federal governments. PALCO also has voluntarily agreed to refrain from logging activities (including salvage logging) in the specified stands pending the development of this Plan. In exchange for the transferred lands, PALCO would receive approximately 7,700 acres of previously harvested timberlands and other consideration (including cash) with an aggregate value of $380 million. Among other things, the Headwaters Agreement conditions the transactions on PALCO's dismissal of pending lawsuits alleging that the state and federal governments have taken PALCO's property in violation of the state and federal constitutions, and on completion and approval of a SYP and HCP for PALCO's property that is acceptable to PALCO. The transactions also are expressly conditioned on compliance with applicable law,

including the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). This Plan is the HCP cited in the September 1996 Headwaters Agreement.

2.3 AGREEMENT IN PRINCIPLE

The February 1998 Agreement in Principle (FEIS, Appendix C) established a framework for the development of the Draft SYP/HCP. It defined certain components of PALCO's ITP applications, addressed procedures for completion of the July 1998 Draft SYP/HCP, and provided for PALCO's implementation of certain conservation measures in the interim. Among other provisions, the agreement includes the following:

- Indicates that PALCO will apply for ITPs that cover 50 years
- Identifies PALCO lands in addition to the Headwaters and Elk Head Springs stands that will be conserved for the marbled murrelet and other species
- States PALCO's commitments regarding implementation of specific stream-related measures in pending THPs prior to issuance of the ITPs and inclusion of those measures in the July 1998 Draft SYP/HCP

The Agreement in Principle did not provide any advance approval of the SYP/HCP by the responsible agencies. As with the Headwaters transactions, approval and implementation of this Plan is subject to all applicable laws, including NEPA and CEQA.

3 SCOPE OF THE PLAN

3.1 PLAN AND PERMIT AREA

The plan area for this HCP is defined as PALCO's ownership as it is anticipated to exist on and following the effective date of the ITPs. As shown in the July 1998 Draft SYP/HCP, Map 2 in Volume IV, which is hereby incorporated by reference, the initial plan area will include approximately 211,700 acres in Humboldt County, California. Except as noted below, the area covered by the ITPs is the same as the plan area. Over time, it is anticipated that additional lands will become part of the plan area, be subject to the provisions of the Plan, and, with certain exceptions, be covered by the ITPs. It also is anticipated that over time some lands in the plan area may be transferred to other owners through land trades and sales. The Implementation Agreement (IA) (FEIS, Appendix S) for this Plan includes provisions for such additions and deletions. See Table 1. The Operating Conversation Plan (OCP), as a covered activity, includes various scientific surveys and studies; a Section 10(a)(1)(A) permit might be required and would be issued under a separate request.

3.2 PLAN AND PERMIT PERIOD

The term PALCO is seeking for the ITPs is 50 years.

3.3 COVERED SPECIES

For SYP as well as HCP purposes, listed and a select list of sensitive species potentially affected by activities in the plan area have been identified as below covered species for which PALCO is seeking ITPs. PALCO may seek to amend the Plan and the ITPs in the future to include one or more other species.

The covered species under this Plan are the marbled murrelet, northern spotted owl, chinook salmon in the southern Oregon/California coastal ESU, coho salmon in the southern Oregon/northern California coastal ESU, cutthroat trout in the southern Oregon/California coast ESU, steelhead trout in the northern California ESU, southern torrent salamander, tailed frog, red-legged frog, foothill yellow-legged frog, northwestern pond turtle, bald eagle, American peregrine falcon, western snowy plover, bank swallow, Pacific fisher, and California red tree vole (Table 2).

3.4 COVERED ACTIVITIES

Subject to the conditions and restrictions identified in this Plan and specified in the ITPs, the following activities would be covered by the authorizations for incidental take.

3.4.1 Timber Management

Timber management is the primary activity in the plan area, occurring on approximately 203,000 acres. Management activities include timber harvest and regeneration, site preparation, planting, vegetation management, thinning, and fire suppression.

Table 1. Watershed Assessment Areas (acres)

Ownership Category	WAA 1 Humboldt Bay	WAA 2 Yager	WAA 3 Van Duzen	WAA 4 Eel	WAA 5 Bear-Mattole	WAA 6 Other Lands[1]	TOTAL
PALCO	38,777	34,107	24,934	75,457	34,528	3,903	211,706
Large Industrial	20,148	5,456	9,524	4,036	14,365	0	53,529
Other Private	60,895	44,068	19,998	287,187	204,614	0	616,762
Parks[2]	7,367	23	837	48,930	236	0	57,393
Government[3]	850	900	48	9,768	50,795	0	62,361
Not Classified	553	0	0	568	206	0	1327
Total Area	128,590	84,554	55,341	425,946	304,744	3,903	1,003,078

Ownership Categories

PALCO	Current ownership, excluding lands to be transferred to government ownership and including lands to be transferred to PALCO under the Headwaters Agreement.
Large Industrial	Other large commercial timber landowners.
Other Private	Small commercial timber landowners and other privately-held lands.
Parks	Local, state, and federal parks and reserves.
Government	Non-park federal and state lands.
Not Classified	Ownership could not be determined.

Notes

1 Includes PALCO lands outside the other five WAAs.

2 Includes the proposed Headwaters and Elkhead Springs reserve in the Humboldt Bay WAA.

3 Includes 7,000+ acres administered by the US Forest Service in the Eel WAA.

Table 2. Covered (List A) Species

Species Common and Scientific Name	Federal Status	State Status
Focus Species		
Marbled murrelet, *Brachyramphus marmoratus*	FT	CE
Northern spotted owl, *Strix occidentalis caurina*	FT	CSSC, BOF
Chinook salmon, *Oncorhynchus tshawytscha*	FPT	CSSC
Coho salmon, *Oncorhynchus kisutch*	FT	CCT
Cutthroat trout, *Oncorhynchus clarki*	FSR	CSSC
Steelhead/rainbow trout, *Oncorhynchus mykiss*	FSR	CSSC
Other List A Species		
Amphibians		
Southern torrent salamander, *Rhyacotriton variegatus*		CSSC
Tailed frog, *Ascaphus truei*		CSSC
Red-legged frog, *Rana aurora*		CSSC
Foothill yellow-legged frog, *Rana boylei*		CSSC
Reptiles		
Northwestern pond turtle, *Clemmys marmorata marmorata*		CSSC
Birds		
Bald eagle, *Haliaeetus leucocephalus*	FT, BEPA	CE, BOF, CFP
American peregrine falcon, *Falco peregrinus anatum*	FE	CE, BOF, CFP
Western snowy plover, *Charadrius alexandrinus nivosus*	FT	CSSC
Bank swallow, *Riparia riparia*		CT
Mammals		
California red tree vole, *Arborimus pomo*		CSSC
Pacific fisher, *Martes pennanti pacifica*		CSSC

Codes			
BEPA	Bald Eagle (and Golden Eagle) Protection Act	FE	Federal endangered species
BOF	Board of Forestry sensitive species	FPT	Proposed for federal listing as threatened
CCT	California candidate for listing as threatened	FSR	Federal status review
CE	California endangered species	FT	Federal threatened species
CFP	California fully protected species		
CSSC	California species of special concern		
CT	California threatened species		

3.4.1.1 Timber Harvesting and Regeneration Methods

Before a forest stand can be harvested, a RPF must prepare a THP. The THP is reviewed by state and, in some cases, federal agencies for consistency with all applicable laws and regulations to ensure that potentially significant environmental impacts are analyzed and fully mitigated to the extent feasible. This requirement has applied to commercial timber operations in California since 1973 (see July 1998 Draft SYP/HCP, Part A in Volume V for additional details).

In the plan area, even-aged and uneven-aged silvicultural prescriptions will be used. Even-aged silviculture is used to regenerate a stand of trees approximately the same age. This objective is achieved by harvesting stands in blocks that typically range in size from 20 to 30 acres. Harvest methods include seed tree removal, shelterwood removal, and clearcutting. Regeneration occurs artificially through planting nursery-grown seedlings, or naturally by well-distributed seed trees. Uneven-aged silviculture is used to harvest trees individually or in

small groups, with the goal of developing or maintaining a variety of age classes within a stand. Typically, sites are restocked through natural regeneration; where necessary, seedlings obtained from a nursery are also used. Harvesting operations begin with the felling and bucking of trees. Logs are moved (yarded) to a landing site using methods based on topographic considerations, access, worker safety, and other factors. Generally, tractor-based systems are used on relatively mild terrain, cable yarders are used on steeper slopes, and helicopters are used in areas where road access is a problem. At the landings, the logs are loaded onto trucks and transported to processing facilities (mills) over private and public roads.

3.4.1.2 Site Preparation

Depending onsite conditions, excessive amounts of slash (mostly branches from trees) and unwanted shrub and tree species are removed. This is typically accomplished by a broadcast burn or, less commonly, by mechanical methods. This treatment only applies to clearcut sites where excessive quantities of slash prevent tree planters from successfully planting trees uniformly throughout the harvest unit. The treatment also has the additional benefit of reducing the potential for wildfire to ignite or spread through the site. Broadcast burning permits must be obtained from CDF and the regional air quality board. If needed, fire trails are constructed to protect resources at risk (e.g., riparian habitat adjacent to a stream). Personnel are located onsite to monitor the burn and to take action in the event of an escape.

3.4.1.3 Planting

Artificial regeneration is principally used to ensure that stocking requirements specified in the California Forest Practice Rules (FPRs) are met. The usual practice is to plant seedlings in those areas that have been clearcut. Seedlings are purchased from a variety of vendors and selected to fit the environmental conditions of site where they will be planted.

3.4.1.4 Vegetation Management

Some sites may require one or more vegetation management treatments to reduce the impacts of unwanted competing vegetation on the growth of seedlings. Such treatments commonly involve the application of herbicides. Vegetation management conducted through use of forest chemicals such as herbicides, pesticides, and fertilizers is not a covered activity under the ITPs. Mechanical methods may also be used to control unwanted vegetation.

3.4.1.5 Thinning

Overstocked even-aged stands will be thinned, where appropriate, to redistribute the growth potential of the site to fewer conifer trees. When such an operation occurs in a very young stand (approximately 15 years old), it is called precommercial thinning. Stems are cut down and left on the site to decay. Commercial thinning requires preparation of a THP and may occur in stands as young as 35 years. Leave trees (i.e., the trees that will be retained) are selected to ensure that they are evenly distributed throughout the site and have the potential to take advantage of the increased growing space. The harvested trees are yarded to a landing, loaded onto trucks, and transported to a processing facility.

3.4.1.6 Fire Suppression

In response to wildfires, activities similar to those used for escaped control burns are used to minimize the total number of affected acres. These activities will be covered by the ITPs and, fire management plans will be prepared for the MMCAs as part of this HCP.

3.4.2 Roads and Landings

Activities for the maintenance, improvement, construction, and closure of roads and landings include the following:

1. Implementation of PALCO's stormproofing program
2. Construction of new roads in connection with timber management, including clearing vegetation from road rights-of-way, removing trees, grubbing (removing stumps and surface organics), grading, and compaction
3. Extraction of rock, sand, and gravel from small borrow pits for use in road construction and maintenance, drainage facility repair, and erosion control
4. Construction of stream crossings (bridges, culverted fills, fords, and a variety of temporary crossings)
5. Maintenance of surfaced roads, seasonal roads, culverts, bridges, fords, cuts and fillslopes
6. Closure of roads, temporarily (i.e., decommissioned) or permanently (i.e., abandoned)

Approximately 150 miles of new roads will be added in the plan area in the first decade of Plan implementation; 100 miles in the second decade, 75 miles in the third decade, 50 miles in the fourth decade, and 25 miles in the fifth decade. At least 750 miles of existing roads will be stormproofed per decade within the first 20 years until all roads on the property have been brought up to that standard.

Additional details regarding road-related activities are provided in the Guidelines for Forest Roads and Landings (July 1998 Draft SYP/HCP, Part N of Volume II).

3.4.3 Commercial Rock Quarries

PALCO operates two permitted commercial hard rock quarries in the plan area. The two commercial quarries are identified as Rock Quarry 1/Road 24 and Rock Quarry 2/Road 9.

- Rock Quarry 1/Road 24 is located in the Yager Creek drainage, approximately five miles upstream from Carlotta, California. The approved Humboldt County conditional use permit and the approved mining and reclamation plan for the quarry provide for a total production of approximately 125,000 cubic yards of aggregate material. The entire quarry site includes approximately 3.5 acres.
- Rock Quarry 2/Road 9 is located in the Lawrence Creek drainage of the Yager Creek watershed. It was operated for many years for in-house use only. Since approval of the conditional use permit, it has been mined for commercial purposes. The volume of available material in Quarry 2 is estimated at approximately 450,000 cubic yards.

These two existing quarry operations will be covered by the ITPs for two years.

Coverage for these operations beyond the two-year period and coverage for any additional quarry sites proposed by PALCO will require amendments to the ITPs and Plan.

Quarry operations involve excavation, drilling, blasting, screening, loading and hauling. Activities ancillary to the quarry operation include road relocation, erosion control, annual closure, and final reclamation. Materials are hauled off-site and transported by truck or rail to their ultimate destination for use as slope stabilization, bedding, and road base. Operations are seasonal, with most mining occurring from April through November. Minor quarrying may occur from December through March in response to local demand for material or the need to provide material for erosion control or road stormproofing activity. Additional information about the quarries is provided in July 1998 Draft SYP/HCP, Part J of Volume II.

PALCO also uses many small sand or rock sources (borrow pits) in the plan area for road maintenance, drainage facility repair, and erosion control. Because of their small size and minor impacts, these borrow pits do not require permits under federal or state regulations and are not mapped or inventoried. Activities associated with these borrow pits are part of PALCO's road and sediment control program and are covered by the ITPs for five years after the effective date. Coverage for borrow pits beyond the five-year period will require an amendment to the ITPs.

4 BASELINE CONDITIONS

A description of baseline conditions is presented in the EIS/EIR for this project. See Tables 3, 4, and 5.

Table 3. Baseline Conditions

Factor	WAA 1 Humboldt	WAA 2 Yager	WAA 3 Van Duzen	WAA 4 Eel	WAA 5 Bear-Mattole	WAA6 Other Lands	TOTAL
Seral Type (acres)							
Forest opening	2,521	989	759	5,454	2,882	11	12,616
Young Forest	6,120	15,282	2,971	12,325	1,804	0	38,502
Mid-successional	12,069	11,014	14,306	25,878	21,140	3,364	87,771
Late Seral	17,461	3,881	5,907	24,440	1,541	6	53,236
Old Growth	71	1,761	153	1,098	3,360	0	6,443
Hardwood	246	221	61	3,010	487	241	4,266
Prairie	0	277	55	973	2,251	281	3,837
Open/non-timber	289	684	721	2,275	1,069	0	5,038
Site Productivity (acres)							
Site Class 1	516	676	1,388	1,711	43	0	4,335
Site Class 2	37,830	32,098	22,342	68,194	27,739	3,334	191,536
Site Class 3	142	347	460	1,827	2,990	198	5,964
Site Class 8	0	35	14	515	487	89	1,141
Site Class 9	289	954	729	3,206	3,271	281	8,729
Watercourses (stream miles)							
Class I	52	56	30	80	44	3	265
Class II	131	123	83	280	118	16	751
Totals	183	179	114	360	161	19	1,017
WLPZs (acres)							
Class I WLPZs	2,113	2,267	1,256	3,577	1,731	140	11,084
Class II WLPZs	2,995	2,686	1,870	6,312	2,648	356	16,866[1/]
Totals	5,108	4,953	3,126	9,889	4,378	496	27,951
Roads (miles)							
Paved/rocked	117.0	142.7	50.5	181.1	15.1	4.7	511.1
Dirt	163.6	125.7	123.4	388.4	141.6	7.0	949.7
Stormproofed	9.5	29.1	0	0	0	0	38.6
Reconstructed	8.4	0.5	3.3	16.3	1.6	0	30.1
Decommissioned	0	1.6	0	0	0	0	1.6
Abandoned	0.6	1.3	0	0	0	0	1.9
Total existing	299.1	300.9	177.2	585.8	158.3	11.7	1533.0
Proposed (first decade)	43.1	15.8	14.8	57.1	15.1	0.4	146.3
Existing and Proposed	342.2	316.7	192.0	642.9	173.4	12.1	1,679.3
Surface Erosion Ratings (acres)							
Low	28,471	29,249	15,263	44,354	12,548	1,905	131,791
Moderate	10,201	4,811	9,201	28,964	20,510	1,651	75,338
High	1	20	108	372	1,331	347	2,178
Extreme	104	27	362	1,151	139	0	1,782
No Data	0	0	0	617	0	0	617
Landslide Hazard Ratings (acres)							
Very Low	557	302	1,614	5,965	4,894	438	13,770
Low	22,842	6,745	9,036	32,046	8,587	382	79,638
Moderate	8,643	2,681	4,724	21,648	8,743	107	46,546
High	2,195	986	1,868	10,805	7,900	7	23,761
Very High	263	364	532	3,557	4,187	0	8,903
Extreme	0	1	5	146	206	0	358
No Data	4,278	23,028	7,155	1,291	11	2,969	38,731
Disturbance index (%)[2/]	15.5	16.8	5.9	12.8	4.3	Not known	11.5

1/ The estimate of acreage for Class II streams is 23,668 acres. The number in the table, 16,866, appears to be in error.
2/ The disturbance index values do not include values for landslide and roads.

Table 4. Distribution of List A Species in the Plan Area

	List A Focus Species
Marbled murrelet	Most old-growth and some residual stands in Plan Area considered actual or potential nesting habitat for this species. Occupied behaviors detected in surveys in 26 stands.
Northern spotted owl	Widely distributed in Plan Area; 147 known owl sites on PALCO ownership. Plan Area includes approximately 80,300 acres of high-quality nesting habitat, 10,600 acres of medium-quality nesting habitat, 70,300 acres of low-quality nesting habitat, 10,800 acres of roosting habitat, and 18,000 acres of foraging habitat.
Chinook salmon	Occur in low numbers throughout Plan Area; data on abundance and distribution within individual watersheds vary. Habitat estimated to occur in approximately 82 miles of streams in the Plan Area.
Coho salmon	Known or thought to occur in large number of streams in each Plan Area watershed; data on abundance and distribution within individual watersheds vary. Habitat estimated to occur in approximately 66 miles of Plan Area streams.
Cutthroat trout	Anadromous cutthroat known to occur in Eel River, in Strongs Creek in the Eel watershed, in the North Fork Elk River watershed, and in Freshwater Creek; data generally not available on occurrence in other areas. Habitat estimated to occur in approximately 31 miles of Plan Area streams.
Steelhead trout	Most widely distributed salmonid in the Plan Area. Within upper Eel WAA, distribution limited by Scott Dam. Data on abundance and distribution within individual watersheds vary. Habitat estimated to occur in approximately 152 miles of streams in the Plan Area.
	Other List A Species
Southern torrent salamander	Widely distributed in suitable habitat in Plan Area. Observed in Bear-Mattole, Yager, Eel, Humboldt, and Van Duzen watersheds.
Tailed frog	Patchy but widespread distribution in suitable habitat in Plan Area. Observed in Humboldt, Yager, Van Duzen, Eel, and Bear-Mattole watersheds. Only the high-gradient reaches with substrates of consolidated parent material are likely to contain suitable habitat.
Red-legged frog	Based on incidental observations, locally abundant in suitable habitat in the Plan Area. Observed in Eel, Humboldt, and Van Duzen watersheds; presumed to occur in other watersheds.
Foothill yellow-legged frog	Commonly observed along major streams such as the Eel and Van Duzen Rivers; also reported from Yager and Bear-Mattole WAAs. Suspected to occur in suitable habitat in Humboldt WAA.
Northwestern pond turtle	Habitat relatively limited on the PALCO ownership; species detected in or near some of the major watercourses in Yager and Eel watersheds. Pond turtles appear to be present in low numbers in suitable habitat.
Bald eagle	No nest site records for PALCO ownership. Wintering birds rare to relatively common along Yager Creek and the Eel, Elk, and Van Duzen rivers; also seen along lower Larabee Creek, near the confluence with Eel River. Seen on PALCO lands generally between November and March (same time as runs of anadromous fish); 3 to 7 wintering birds seen in Yager watershed, 1 to 2 in Eel and Humboldt watersheds.
American peregrine falcon	In north coast region, an uncommon migrant and winter visitor; a rare, local breeder (approximately eight known sites in bioregion) and summer resident. One recorded nest site in Plan Area, on cliff adjacent to Eel River; site may have been damaged or eliminated during the winter of 1995 due to failure of the rock face.
Western snowy plover	Uncommon local migrant and winter visitor; rare, local breeder. Observed in the bioregion on inland river bars from the Eel River delta upstream to at least the mouth of the Van Duzen River.
Bank swallow	On north coast, considered a rare migrant and locally rare breeder. No nesting colonies are known on or near the PALCO ownership.
California red tree vole	Widespread in the Plan Area.
Pacific fisher	Detected in the Plan Area in the multi-species study in the Yager and Humboldt watersheds.

Table 5. Animal and Plant Species Richness by Seral Type

Seral Type	Animal Species	Plant Species
Forest Openings	72	88
Young Forests	127	130
Mid-successional	112	122
Late Successional	116	130
Montane Hardwood	76	98
Perennial Grassland	64	62

5 ALTERNATIVES CONSIDERED

The FESA requires that HCPs identify alternatives to the proposed taking and explain why such alternatives were not selected. A broad range of impact avoidance, mitigation, and conservation strategies were proposed and considered in the course of preparing this Plan, including variations on the LTSY projections and HCP strategies.

Four primary alternatives are summarized here: Take Avoidance; Selective Harvest; Expanded (61,000-acre) Headwaters Reserve; and Higher Midterm Timber Production.

5.1 TAKE AVOIDANCE

Under this alternative, activities in the plan area would be conducted in a manner to avoid take of any federally listed, state listed, or state candidate species. Since no take would occur, PALCO would not need or obtain ITPs from USFWS, NMFS, or CDFG. PALCO would not be obligated to implement measures to minimize and mitigate the effects of take. Consequently, the Headwaters Reserve would not be established, and the Plan would not be implemented. This alternative was rejected because it would not provide the following environmental benefits associated with the Plan as proposed:

1. Protection of the Headwaters Reserve, including buffer areas around the old-growth forest within the Reserve, in perpetuity
2. Protection of the MMCAs and associated internal buffer areas
3. Implementation of comprehensive, inter-related habitat conservation strategies for terrestrial and aquatic species in the plan area
4. Implementation of various conservation measures for non-listed covered species

This alternative also was rejected because of its potential negative effects, including the following:

1. Fragmentation of second growth and residual stands adjacent to old-growth areas with potential for resulting indirect impacts to old-growth habitat areas through potential increased predation on marbled murrelets
2. Continued economic uncertainty regarding the amount of harvest that might be expected from the PALCO property in the future and the resulting adverse economic impact to the economy of Humboldt County

5.2 SELECTIVE HARVEST

Under this alternative, the SYP elements of the Plan as proposed would be altered to eliminate clear-cutting and salvage logging in the plan area. Stands would be subject to selective harvest every 20 years, with a timber stand target of late seral forest conditions (CWHR 6). The maximum yearly harvest would be 2 percent of the timber inventory. In addition, a minimum of 20 percent of the property would have to be in late seral habitat. Two sub-alternatives for RMZs also were considered:

- Forest Ecosystem Management Team (FEMAT) standard buffers maintained for the term of the ITPs
- FEMAT standard buffers as interim measures with final buffers being determined using a Washington Department of Natural Resources (WDNR) style watershed analysis

This alternative was not selected because a selective harvest strategy would require extensive road construction. It would limit PALCO's ability to use best silvicultural practices to manage its forests. The net improvement in aquatic protection over that in the proposed Plan is uncertain but is probably limited. The alternative would also have a significant negative economic impact on PALCO. With respect to economic impacts, the FEMAT buffers alone would render PALCO's ownership more than 50 percent unharvestable. (Map 36 in Volume V illustrates the application of FEMAT buffers to the plan area.)

5.3 EXPANDED HEADWATERS RESERVE

Under this alternative, a 61,000-acre reserve would be established instead the 7,500-acre reserve contemplated in the Headwaters Agreement. The approximate design of the reserve would be a large circle encompassing the six redwood groves (Allen Creek, Shaw Creek, Bell-Lawrence, Right 9, Owl Creek, and Elkhead Springs) and the Headwaters tract and buffer. Outside of the reserve, the remainder of PALCO's property would be managed in the same manner as proposed in this Plan.

Approximately 30 percent of PALCO's holdings in the plan area would become part of the reserve, including stands with significant amounts of high-quality, old-growth timber. PALCO is unwilling to commit such a large amount of land to habitat without compensation, and neither the federal FESA nor CESA requires such a commitment. The only method of creating the preserve, then, is through condemnation or voluntary sale. Neither the federal nor the state government has demonstrated that funds are available to acquire the reserve; and California voters have turned down ballot measures aimed at acquiring this property. The acquisition amount would far exceed any conservation acquisition undertaken by the federal and state governments since the enactment of the Land and Water Conservation Fund. In the absence of available funds for acquisition of the land, this alternative is not practicable.

5.4 INCREASED MIDTERM PRODUCTION

This alternative was developed to determine the possible upper range of timber production on PALCO's lands. Under this alternative, higher harvest levels would be allowed during the midterm of the ITPs. Riparian buffers would be 125 feet for Class I streams and 75 feet for Class II streams, with extensive timber harvest allowed within these zones. Limits on harvesting would be set by existing FPRs. No MMCAs would be established; however, the Headwaters transactions would be completed. This alternative was rejected primarily because of the inherent conflicts between the timber production goals of the approach and ITP requirements to minimize, as well as to mitigate, effects on listed species.